FIRE AND MATERIALS

1998 **Volume 22**

FMATDV 22(1–6) 1–258 (1998)
ISSN 0308–0501

FIRE AND MATERIALS

AN INTERNATIONAL JOURNAL

(Fire mater.)

Editor-in-Chief

John P. Redfern
18 Avon Park
Ringwood
Hampshire BH24 2AT, UK
Fax: +1425 489770

Managing Editor

S. J. Grayson
Queen Mary and Westfield College
Department of Materials,
Mile End Road, London E1 4NS, UK
Fax: +181 318 3932

Associate Editors

M. Hirschler
GBH International
2 Friar's Lane
Mill Valley
California 94941, USA
Fax: +415 388 5546

M. Janssens
Southwest Research Institute
6220 Culebra Road, San Antonio
Texas 78228-0510, USA
Fax: +210 522 3377

M. Kokkala
VTT Building Technology
Fire Technology, PO Box 1803
FIN-02044 VTT, Finland
Fax: +358 0456 4815

H. Suzuki
Center for Research and Development
Yamato Protec Corporation
1951 Nagasao Dohmae, Kawachi-machi
Inashiki-gun, Ibaraki 300-13, Japan
Fax: +81 297 84 4712

Advisory Board

N. Alvares
Fire Science Applications
751 Laurel Street, Suite 431
San Carlos, CA 94070, USA

V. Babrauskas
Fire Science & Technology Inc.
9000 300th Place SE
Issaquah, WA 98027, USA

W. H. K. Becker
University of Kaiserslautern
Im Kaestenbusch 15
D-67434 Neustadt/Weinstrasse
Germany

D. Buszard
373 Chester Road, Woodford
Cheshire SK7 1QQ, UK

G. Camino
Associato di Chimica
Macromoleculare all'
Universita di Torino
Dipartimento di Chimica
Inorganica, Chimica Fisica
e Chimica dei Materials
via P. Giuria 7-10125,
Torino, Italy

L. Chesné
LNE, 5 rue Enrico Fermi
78190 Trappes, France

G. Cox
Fire Research Station
Building Research Establishment
Garston, Watford WD2 7JR, UK

W-C. Fan
State Key Laboratory of Fire
Science
University of Science and
Technology of China
Hefei, Anhui 230026, China

R. G. Gann
Building and Fire Research
Laboratory,
National Inst. of Standards and
Technology
Gaithersburg, MD 20899, USA

A. Grand
Omega Point Laboratories Inc.
16015 Shady Falls Road
Elmendorf, Texas 78112, USA

S. Grubitz
CSIRO, Division BCE
North Ryde
New South Wales 2113,
Australia

Y. Hasemi
Building Research Institute
Ministry of Construction
Tatehara 1, Tsukuba City
Ibaraki Pref., 305 Japan

N. R. Keltner
KTECH Corporation
901 Pennsylvania NE
Albuquerque
New Mexico 87110-7403, USA

S. E. Magnusson
Department of Fire Safety
Engineering
Lund Institute of Technology
Lund University Box 118
S-221 00 Lund, Sweden

J. Mehaffey
Fire Protection Engineering
Dept. of Chemical Engineering
University of British Columbia
Vancouver, BC V6T 1Z4
Canada

E. Metcalfe
School of Biological and
Chemical Sciences
University of Greenwich
Woolwich Campus
Wellington Street
London SE18 6PF, UK

E. Mikkola
VTT Building Technology
Fire Technology PO Box 1803
FIN-02044 VTT, Finland

I. Nakaya
Codes and Evaluation Research
Center
Building Research Institute
Ministry of Construction
1 Tatehara, Tsukuba-Shi
Ibaraki 305, Japan

F. H. Prager
Bayer AG
ZF-DZA Brandtechnologie
5090 Leverkusen
Bayerwerk, Germany

D. Purser
22 Prospero Way
Hartford, Huntingdon
Cambridgeshire PE18 7PG, UK

O. Sugawa
Center for Fire Research and
Technology
Science University of Tokyo
2641 Yamasaki Noda, Chiba 278
Japan

B. Sundstrom
Fire Technology
Swedish National Testing Inst.
Brinellgaten 4
PO Box 857
S-05115 Boras, Sweden

P. Thomas
Kings Cottage, 1 Red Road
Borehamwood
Herts WD6 4SW, UK

R. B. Williamson
University of California
Dept of Civil Engineering
773 Davis Hall
Berkeley CA 94720, USA

W. D. Woolley
Fire Research Station
Building Research Establishment
Garston, Watford WA2 7JR, UK

Copyright © 1998 John Wiley & Sons Ltd.

Printed and bound in Great Britain by Page Bros, Norwich

Contents of Volume 22

NUMBER 1 JANUARY–FEBRUARY 1998

Relationship between Heat of Combustion, Lignin Content and Burning Weight Loss 1
J. FANGRAT, Y. HASEMI, M. YOSHIDA AND S. KIKUCHI

Effect of Glass Fibres and Fire Retardant on the Combustion Behaviour or Composites, Glass Fibres–Poly(butylene terephthalate) 7
A. CASU, G. CAMINO, M. DE GIORGI, D. FLATH, A. LAUDI AND V. MORONE

Application of Cone Calorimeter for the Assessment of Class of Flame Retardants for Polypropylene 15
G. GALLINA, E. BRAVIN, C. BADALUCCO, G. AUDISIO, M. ARMANINI, A. DE CHIRICO AND F. PROVASOLI

Reduction of the Thermoplastic Melt Hazard of Polyester Fabric Through the Application of a Radiation Cross-linking Technique 19
S. ELTON

Repeatability and Reproducibility of Fire Tests for Cigarette Ignition of Upholstered Furniture Composites 25
M. M. HIRSCHLER

Short Communication: Mathematical Expression of Heat Release Rate Curve and Proposal of `Burning Index' 39
F. NUMAJIRI AND K. FURUKAWA

Letters to the Editor 43

News 45

NUMBER 2 MARCH–APRIL 1998

Microkinetics of the High-temperature Pyrolysis 47
N. A. KHALTURINSKIJ, I. S. RESHETNIKOV, M. YU. YABLOKOVA, T. A. RUDAKOVA AND V. S. SVISTUNOV

Charring of Protected Wood Studs 55
L. D. TSANTARIDIS AND B. A-L. ÖSTMAN

Characterization of Flame-retarded Polymer Combustion Chars by Solid-state ^{13}C and ^{29}Si NMR and EPR 61
J. W. GILMAN, S. LOMAKIN, T. KASHIWAGI, D. L. VANDERHART AND V. NAGY

Shielding Effects of Silica-ash Layer on the Combustion of Silicones and Their Possible Applications on the Fire Retardancy of Organic Polymers 69
F-Y. HSHIEH

Functionally Graded Wood in Fire Endurance with Basic Nitrogen Compounds and Phosphoric Acid 77
H. GETTO AND S. ISHIHARA

Letters to the Editor 85

Conference Announcement 88

NUMBER 3 MAY–JUNE 1998

The Functional Gradient of Fire Resistance Laminated Board 89
H. GETTO AND S. ISHIHARA

Dynamics of Concurrent Flame Spread Over a Thin Charring Solid in Microgravity 95
C. DI BLASI

Modelling the Thermal Decompositions of Wood and Leaves Under a Nitrogen Atmosphere 103
N. A. LIU AND W. C. FAN

A Theory for Quasi-Steady Single-Step Thermal Degradation of Polymers 109
J. E. J. STAGGS

Combustion Behaviour of Ethylene Vinyl Acetate Copolymer-Based Intumescent Formulations Using Oxygen Consumption Calorimetry 119
C. SIAT, M. LE BRAS AND S. BOURBIGOT

Letters to the Editor 129

NUMBER 4 JULY–AUGUST 1998

WALL2D: a Model for Predicting Heat Transfer through Wood-Stud Walls Exposed to Fire 133
H. TAKEDA AND J. R. MEHAFFEY

The Functionally Graded Wood Observed from Chemical and Thermal Perspectives 141
H. GETTO AND S. ISHIHARA

Flame-Retarding Properties of Ion-Exchanging Groups Introduced into Beech Sawdust 149
I. ŠIMKOVIC AND K. CSOMOROVÁ

Effects of the Structural Properties of Solid Fuels on Their Re-Ignition Characteristics 155
B. MOGHTADERI, B. Z. DLUGOGORSKI, E. M. KENNEDY AND D. F. FLETCHER

Evaluation of Heat Release Rate Equations Used in Standard Test Methods 167
B. Y. LATTIMER AND J. J. BEITEL

Short Communication: Comparison of the Propensity of Cigarettes to Ignite Upholstered Furniture Fabrics and Cotton Ducks (500-Fabric Study)—a Second Opinion 175
A. L. RHYNE

NUMBER 5 SEPTEMBER–OCTOBER 1998

Experimental Study on the Radiative Ignition of Silicones 179
F.-Y. HSHIEH AND C. J. JULIEN

Comparison of Four Combustion Models for Simulating the Premixed Combustion in Inert Porous Media 187
X. Y. ZHOU AND J. C. F. PEREIRA

The Fire Retardance and Endurance of Functionally Graded Wood in the Case of Heat-Compressed Treatment Method 199
H. GETTO AND S. ISHIHARA

Improving Fire Retardancy of Fast Growing Wood by Coating with Fire Retardant and Surface Densification 207
SUBYAKTO, T. KAJIMOTO, T. HATA, S. ISHIHARA, S. KAWAI AND H. GETTO

Investigations of Conveyor Belts Flammability. Comparison of Flammability Assessment using the Large-Scale Gallery Test and Cone Calorimeter 213
JAN WACHOWICZ

Letter to the Editor 219

NUMBER 6 NOVEMBER–DECEMBER 1998

Gasification of Silicone Fluids Under External Thermal Radiation. Part 1. Gasification Rate and Global Heat of Gasification 221
P. J. AUSTIN, R. R. BUCH AND T. KASHIWAGI

Gasification of Silicone Fluids Under External Thermal Radiation. Part 2. Gasification Products—Characterization and Quantitation 239
R. R. BUCH, P. J. AUSTIN AND T. KASHIWAGI

New Polyester Resins with Reduced Flammability and Smoke Evolution Capacity 253
E. KICKO-WALCZAK

Author Index 257